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Type: **Parallel session talk**

New results on $|V_{ub}|$ using Inclusive and Exclusive Decays

Wednesday 23 August 2023 08:30 (17 minutes)

We report the measurement of the partial branching fraction of $B \rightarrow X_u \ell \bar{\nu}_\ell$ over $B \rightarrow X_c \ell \bar{\nu}_\ell$ using the complete Belle data set of 711 fb^{-1} . We reconstruct collision events where one B meson is fully reconstructed in hadronic modes using the full-event-interpretation algorithm, developed for Belle II. This allows for the reconstruction of the hadronic X_u system associated with the semileptonic $b \rightarrow u \ell \bar{\nu}_\ell$ decay. We further perform the first simultaneous determination of the absolute value of the CKM matrix element V_{ub} by leveraging both inclusive and exclusive decays with the complete Belle data set using a similar technique. To disentangle exclusive $B \rightarrow \pi \ell \bar{\nu}_\ell$ decays from other inclusive $B \rightarrow X_u \ell \bar{\nu}_\ell$ events and backgrounds, we employ a two-dimensional fit that utilizes the charged pion multiplicity in the X_u system and the four-momentum transfer q^2 between the B and X_u system. Both results provide new insights in the tension of the value of V_{ub} between inclusive and exclusive determinations.

Collaboration / Activity

Belle Collaboration

Primary authors: BERNLOCHNER, Florian (BELLE (BELLE II Experiment)); CAO, Lu (BELLE (BELLE Gruppe)); HOHMANN, Marcel (BELLE (BELLE II Experiment))

Presenter: CAO, Lu (BELLE (BELLE Gruppe))

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